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(54) COMPLIANT DYNAMIC SPINAL IMPLANT AND ASSOCIATED METHODS

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See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

3,945,053	A	3/1976	Hilberry et al.
5,405,408	A	4/1995	Pitkin
5,415,661	A	5/1995	Holmes
5,772,661	A	6/1998	Michelson
6,045,552	A	4/2000	Zucherman et al.
6,379,354	B1	4/2002	Rogozinski
6,440,169	B1	8/2002	Elberg et al.
6,527,804	B1	3/2003	Gauchet et al.
6,540,785	B1	4/2003	Gill et al.
6,572,653	B1	6/2003	Simonson
6,579,320	B1	6/2003	Gauchet et al.
6,610,093	B1	8/2003	Pisharodi

(Continued)

FOREIGN PATENT DOCUMENTS

KR 1020050080493 8/2005 KR 1020060113318 11/2006

(Continued)

OTHER PUBLICATIONS

U.S. Appl. No. 11/952,709, filed Dec. 7, 2007; Michael D. Ensign; office action mailed Mar. 17, 2011.

(Continued)

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(57) ABSTRACT

A spinal implant comprises a plurality of contiguous segments, said plurality of contiguous segments configured to apply a torque to a degenerate spinal segment in any of three orthogonal axes. At least one mounting connection is configured to connect said spinal implant to a mounting mechanism, said mounting mechanism being configured to attach said spinal implant to said degenerate spinal segment.

29 Claims, 14 Drawing Sheets

